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Wilfried Sieg* (sieg@cmu.edu), Department of Philosophy, Carnegie Mellon University,
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The concept of computability is intertwined with investigations on the foundations of mathematics in the early 20th century, most explicitly in the 1930s. That is seen when considering Gödel's incompleteness theorems and Turing's undecidability theorem. They responded to issues emphasized by Hilbert: the consistency and the decision problem.

Around 1950, Gödel and Turing turned attention to mental processes and addressed, in particular, the question: Do the incompleteness theorems justify the claim that the human mind has mathematical abilities that are not shared by any machine? Gödel's view is expressed by the assertion, "The human mind infinitely surpasses any finite machine." Turing predicted that machines would do mathematics on their own - within fifty years.

I will argue that the contrast between these positions is not as stark as it may seem. If one focuses on the real challenge presented by Gödel's theorems, then there is a structurally similar approach to the question that leads to complementary programmatic directions, but is based on dramatically different philosophical perspectives. It can be taken as a challenge for exploring the capacities of the human mathematical mind by constructing automated procedures to find proofs in mathematics. (Received September 15, 2011)